

We claim:

- 5 1. A device for generating mechanical work by means of a steam engine in a closed circuit, said closed circuit comprising in series a feed water tank, a feed pump, an evaporator, said steam engine and a condenser, said feed pump drawing water from said feed water tank and feeding this water to said evaporator, steam under pressure from said evaporator being fed as working medium to said steam engine, exhaust steam from said steam engine being condensed by said condenser and returned to said feed water tank, frost-sensitive parts of said closed circuit being prone to be damaged by frost, wherein said feed water tank is of frost resistant design, water in said feed water tank has a water surface, said feed water tank defining a gas space above said water surface, said gas space being filled with a gas, and further comprising means for expelling, by means of said gas, feed water from, at least, the frost-sensitive parts of the circuit and for pressing said expelled feed water into said frost resistant feed water tank.
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- 20 2. A device as claimed in claim 1, wherein said expelling means comprise:
a variable volume feed water reservoir and
valve means having first, second, third and forth valve states for determining interconnections in said closed circuit,
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- 30 in said first valve state of said valve means, the circuit from feed water tank via feed pump, evaporator, steam engine and condensor back to the feed water tank being closed for normal operation
in said second valve state of said valve means, the feed pump is connected to feed water from said feed water reservoir to said feed water tank, thereby pressurizing

said gas in a system comprising said evaporator, said steam engine and said condenser,

5 in said third valve state of said valve means, said feed water tank is separated from the remainder of the circuit and is connected to said variable volume reservoir to release the pressure built up therein, and

10 in said fourth valve state of said valve means, said system being connected to said de-pressurized feed water tank, whereby said pressurized gas flushes water contained in said system into said feed water tank,

and valve control means for causing said valve means to assume one of said first, second, third and forth valve state.

15 3. A device as claimed in claim 2, wherein said valve means have a fifth valve state, in which said gas is kept pressurized in said system.

4. A device as claimed in claim 2, wherein

20 said circuit comprises a first pipe section communicating, on one hand, with said feed water tank below said water surface and, on the other hand, with said feed pump, and further comprises a connecting pipe communicating said first pipe section with said variable volume reservoir,

25 said circuit comprising a second pipe section connecting said feed pump and said evaporator

a third pipe section communicates, on one hand, with the condensor and, on the other hand, with said gas space above said water surface of said feed water tank,

30 a fourth pipe section communicates with said gas space above said water surface, on one hand, and with said second pipe section, on the other hand,

said valve means comprise:

5 first and second controllable valves arranged in series in said first pipe section, said connecting line opening into said first pipe section between said first and second controllable valves,

10 third and fourth controllable valves arranged in series in said second pipe section, said fourth pipe section communicating with said second pipe section between said third and fourth controllable valves,

a fifth controllable valve arranged in said forth pipe section,

15 a sixth controllable valve arranged in said third pipe section, and

a seventh controllable valve arranged in said connecting pipe communicating said first pipe section with said variable volume reservoir,

said valve control means are operative:

20 in said first valve state of said valve means to open said first, second, third forth and sixth valves, the remaining valves being closed,

25 in said second valve state of said valve means, to open said second, third, fifth sixth and seventh valves, the remaining valves being closed,

in said third valve state of said valve means, to open said first valve and said seventh valve, the remaining valves being closed,

30 in said fourth valve state of said valve means, to open said forth valve and said fifth valve, the remaining valves being closed.

5. A device as claimed in claim 1, wherein said gas is a gas of the type forming a gas hydrate with water.
6. A device as claimed in claim 5, wherein said gas is xenon.
7. A device for generating mechanical work by means of a steam engine in a closed circuit, said closed circuit comprising in series a feed water tank, a feed pump, an evaporator, said steam engine and a condenser, said feed pump drawing water from said feed water tank and feeding this water to said evaporator, steam under pressure from said evaporator being fed as working medium to said steam engine, exhaust steam from said steam engine being condensed by said condenser and returned to said feed water tank, frost-sensitive parts of said closed circuit being prone to be damaged by frost, wherein
water in said feed water tank has a water surface, said feed water tank defining a gas space above said water surface, said gas space being filled with a gas, of the type forming a gas hydrate with water,
said circuit comprises a first pipe section communicating, on one hand, with said feed water tank below said water surface and, on the other hand, with said feed pump, and further comprises a connecting pipe communicating said first pipe section with said variable volume reservoir,
said circuit comprising a second pipe section connecting said feed pump and said evaporator
a third pipe section communicates, on one hand, with the condensor and, on the other hand, with said gas space above said water surface of said feed water tank,
a fourth pipe section communicates with said gas space above said water surface, on one hand, and with said second pipe section, on the other hand,

valve means have first, second, and fifth valve states for determining interconnections in said closed circuit,

valve control means are provided for causing said valve means to assume one of said first, second, third and forth valve states,

said valve means comprising

first and second controllable valves arranged in series in said first pipe section, said connecting line opening into said first pipe section between said first and second controllable valves,

third and fourth controllable valves arranged in series in said second pipe section, said fourth pipe section communicating with said second pipe section between said third and fourth controllable valves,

a fifth controllable valve arranged in said forth pipe section,

a sixth controllable valve arranged in said third pipe section, and

a seventh controllable valve arranged in said connecting pipe communicating said first pipe section with said variable volume reservoir,

said valve control means are operative:

in said first valve state of said valve means to open said first, second, third forth and sixth valves, the remaining valves being closed,

in said second valve state of said valve means, to open said second, third, fifth and sixth valves, the remaining valves being closed,

in said fifth valve state of said valve means to close all valves, and,

when the device is to be shut down, to switch said valve means from said first valve state, first, into said second valve state,